

PATENT

Att'y Docket No.: 200311332-2
App. Ser. No.: 10/736,353

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the claim amendments and following remarks.

By virtue of the amendments above, claims 31-34, 50, and 60 are amended herein. Claims 1-3, 5, 10, 13, 16-18, 20, 25, 27, 28, 30, 40-47, and 49 were cancelled in previous amendments and claims 21-24, 29, 51-53, 56-59, 61-63, and 65-67 are cancelled by virtue of the amendment submitted herein without prejudice or disclaimer of the subject matter contained therein. Accordingly, claims 4, 6-9, 11, 12, 14, 15, 19, 26, 31-39, 48, 50, 54, 55, 60, and 64 are pending in the present application, of which claims 4, 19, 48, 50, 60, and 64 are independent.

Claims 4, 6-9, 11, 26, 29, 31-36, 48 and 50-59 were rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Carcia et al. (US 2004/0127038) ("Carcia").

Claims 19, 21, 22 and 24 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Taylor (4,521,698) ("Taylor").

Claim 12 was rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Hong et al. (6,674,495) ("Hong").

Claim 23 was rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Hong.

Claims 14 and 38 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Krivokapic et al. (6,100,558) ("Krivokapic").

Claims 15 and 39 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia and Krivokapic and over Carcia, Cillessen et al. (5,744,864) ("Cillessen"), and Krivokapic and further in view of Hornik et al (2004/0169210) ("Hornik").

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Claims 60-63 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Cillessen.

Claims 64-67 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Cillessen and Ando et al (6,184,946) ("Ando").

Claims 4, 7-9, 12, 19, 22-24, 26, 29, 32-35, 37, 48, 50-53, 54-59, 60-63 and 64-67 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Cillessen.

Claims 6, 11, 31 and 36 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Cillessen in view of Carcia.

No new matter has been introduced by way of the claim amendments; entry thereof is therefore respectfully requested.

Claim Rejection Under 35 U.S.C. §102

The test for determining if a reference anticipates a claim, for purposes of a rejection under 35 U.S.C. § 102, is whether the reference discloses all the elements of the claimed combination, or the mechanical equivalents thereof functioning in substantially the same way to produce substantially the same results. As noted by the Court of Appeals for the Federal Circuit in *Lindemann Maschinenfabrick GmbH v. American Hoist and Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984), in evaluating the sufficiency of an anticipation rejection under 35 U.S.C. § 102, the Court stated:

Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.

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Therefore, if the cited reference does not disclose each and every element of the claimed invention, then the cited reference fails to anticipate the claimed invention and, thus, the claimed invention is distinguishable over the cited reference.

Claims 4, 6-9, 11, 26, 29, 31-36, 48 and 50-59 were rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Carcia. For at least the following reasons, it is respectfully submitted that this rejection is clearly improper and should be withdrawn.

Claims 4, 48, and 50: Zn_2SnO_4 and $(ZnO)_x(SnO_2)_{1-x}$

Independent claims 4 and 48 recite, *inter alia*, "a channel...comprised of a ternary compound containing zinc, tin and oxygen...having the following stoichiometry: Zn_2SnO_4 ." Although Carcia is applied against claims 4 and 48 under a 35 U.S.C. 102 anticipation rejection, the Official Action acknowledges that Carcia fails to disclose, not only a ternary compound, but also the claimed ternary compound composed of zinc, tin, and oxygen, as well as the claimed stoichiometry. In addition, Carcia discloses a list of binary compounds, which include zinc oxide (ZnO) and tin oxide (SnO₂). The rejection thus relies on a disclosure by Carcia to use "combinations" of the disclosed binary compounds to render the allegation that Carcia anticipates the claimed features.

As previously noted, the suggestion that Carcia anticipates, at least, the claimed features recited above is clearly improper. A compound is anticipated only if its disclosure in a single reference places that composition in the immediate possession of the public. The reference must "clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without any need for picking, choosing, and combining various disclosures..." *In re Arkley*, 455 F.2d 586, 587, 172 USPQ 524, 526 (CCPA 1972).

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Here, the Official Action is clearly "picking, choosing, and combining various disclosures" from Carcia to reconstruct the claimed features from the limited disclosure of Carcia. Thus, the rejection is improper.

The list of compounds disclosed by Carcia includes four types of binary oxides: ZnO, In_2O_3 , SnO_2 , and CdO. The simple combination of these oxides in all possible combinations would yield six types of ternary oxides, four types of quaternary oxides, and one oxide family that includes all four metals and oxygen. However, none of the 15 compounds resulting from the simple combination of the four disclosed binary compounds would result in the claimed stoichiometry: Zn_2SnO_4 . This is because the claimed stoichiometry can only be created by adding two zinc oxide molecules to a single tin oxide molecule represented by the following formula: $2\text{ZnO} + \text{SnO}_2 \rightarrow \text{Zn}_2\text{SnO}_4$. Therefore, a simple combination of the compounds disclosed by Carcia would not result in the claimed features. Instead, the claimed stoichiometry can only be created by picking and choosing two molecules of zinc oxide for combination with one molecule of tin oxide from amongst the four disclosed binary compounds.

Moreover, Carcia fails to teach the use of a ternary compound. In fact, Carcia only discloses the use of binary compounds (see examples 1-7 of Carcia). Therefore, Carcia cannot possibly teach the claimed stoichiometry: Zn_2SnO_4 , because Carcia only discloses the use of binary compounds.

Similarly, claim 50 recites, *inter alia*, "a ternary compound containing zinc, tin and oxygen...having the following stoichiometry: $(\text{ZnO})_j(\text{SnO}_2)_{1-j}$, where j is between 0.05 and 0.95." This feature was previously recited in claim 53, which was rejected on the grounds that "for $j=0.5$...the stoichiometric formula corresponds to a single compound, namely

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ZnSnO₃ because only the ratios of the stoichiometric parameter values have physical meaning." The Applicants fail to understand the meaning of this statement and request clarification in the event that this ground of rejection is maintained.

In any event, Carcia fails to disclose, or inherently teach, this feature. The stoichiometry: (ZnO)_j(SnO₂)_{1-j}, where j is between 0.05 and 0.95" refers, of course, to non-stoichiometric compounds that do not correspond to the law of definite proportions. Carcia is completely silent with respect to the possibility of creating non-stoichiometric compounds. To the contrary, Carcia discloses only compounds corresponding to the law of definite proportions.

Moreover, a compound having the "stoichiometry: (ZnO)_j(SnO₂)_{1-j}, where j is between 0.05 and 0.95" could not be created from the simple mixture of the four binary compounds disclosed by Carcia, because different proportions of the individual components must be combined to create the claimed non-stoichiometric ternary compound. Therefore, the compound (ZnO)_j(SnO₂)_{1-j}, where j is between 0.05 and 0.95, is not taught by Carcia for at least the reasons set forth above.

As such, the Applicants respectfully submit that the rejection of independent claims 4, 48, and 50 over Carcia is clearly improper because Carcia does not anticipate, at least, the claimed features recited above. Accordingly, withdrawal of this rejection and allowance of the claims is respectfully requested.

Substantially Amorphous

In addition, Carcia fails to teach the zinc-tin oxide compound being "substantially amorphous," as recited in claims 6 and 31. The Official Action alleges that the process of

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sputtering inherently "creates substantially amorphous forms of zinc oxide based oxides, as witnessed for example by Henrichs (2003/0185266A1) ("Henrichs")," in paragraph 46 of Henrichs.

With respect to inherency, the MPEP requires that an "EXAMINER MUST PROVIDE RATIONALE OR EVIDENCE TENDING TO SHOW INHERENCY (MPEP 2112IV). The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted)." Furthermore, the MPEP states that "in relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)

Here, the Official Action has failed to meet the burden of providing any basis in fact tending to show that the process of sputtering inherently results in the formation of an amorphous zinc-tin oxide compound. The only attempt to proffer evidence is the citation of

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paragraph 46 of Henrichs. However, the Applicants initially note that the cited paragraph fails to even address the claimed features. Claim 6, like claim 31, refers to a substantially amorphous "zinc-tin oxide compound." However, Henrichs describes an undoped zinc-oxide material. Therefore, the alleged evidence provided in the Official Action fails to even address the claimed feature. That is, Henrichs is drawn to a description of a zinc-oxide material, as opposed to the claimed zinc-tin oxide compound having the stoichiometry: Zn_2SnO_4 . The description of a completely different chemical material cannot possibly be construed as evidence providing any teaching related to the claimed compound. Therefore, the Official Action has failed to meet the burden required by the MPEP of providing evidence to support the allegations made in the Official Action.

Moreover, the alleged evidence fails to show that sputtering inherently creates an amorphous material, whether zinc oxide or not. In paragraph 46, Henrichs states that "ion sputtering...is normally used to epitaxially deposit dielectric amorphous materials." Thus, contrary to the erroneous conclusion reached in the Official Action, Henrichs fails to provide any suggestion whatsoever that sputtering inherently creates an amorphous material. In contrast to the allegations made in the Official Action, Henrichs merely discloses that sputtering is often used to deposit amorphous materials.

In addition, even if Henrichs taught that ion sputtering inherently created amorphous zinc oxide (which it does not), Carcia discloses that other processes may be used. For example, in paragraph 39, Carcia discloses that any chemical or physical vapor deposition may be used. Therefore, the films of Carcia may be created by processes other than the ion sputtering process described by Henrichs. As such, the Henrichs reference has no bearing on the films of Carcia, because Henrichs fails to teach the other processes disclosed by Carcia.

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Furthermore, Carcia specifically teaches away from the proffered allegation that sputtering inherently creates amorphous zinc oxide films. For example, in paragraph 32, Carcia teaches that sputtering creates polycrystalline films of zinc oxide. The Applicant notes that a polycrystalline film cannot also be amorphous. Therefore, Carcia actually teaches the opposite of the allegation made in the Official Action.

As such, Carcia clearly fails to inherently disclose an amorphous zinc-tin oxide compound, as recited in claims 6 and 31. In the event that this allegation is maintained, the Applicants request some showing of proof to support said allegation. However, the Applicants also respectfully submit that no showing could possibly overcome the disclosure by Carcia that sputtering creates polycrystalline films (paragraph 32 of Carcia).

Phase-Segregated

Carcia also fails to teach "phase-segregated ZnO" and "phase-segregated SnO₂," as recited in claims 8 and 9, respectively, as well as claims 33 and 34, respectively.

The Official Action states that the features of claims 8 and 9 "are met by virtue of the finite dissociation constant of Zn₂SnO₄," of which the "Examiner has previously taken official notice." Initially, the Applicants note the Examiner provided no documentary evidence to support the allegation of official notice and also that the rejection states that the official notice is "considered prior art admitted by the Applicants," under MPEP 2144.03. However, the Applicants strongly disagree with the allegations made in the Official Action and do not consider the erroneous statements made in the official notice as prior art for the reasons set forth below.

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First, the Applicants note that the initial rejections stated that "on claims 8, 9, 33, and 34; the channel further includes, based on the presence of the claimed ZnSnO_3 compound, phase segregated ZnO and SnO_2 by virtue of the finite dissociation constant of ZnSnO_3 . Later in prosecution, however, the non-final Official Action of June 7, 2006 changes the basis of the rejection to refer to Zn_2SnO_4 , instead of ZnSnO_3 , and states that "for the finiteness of said dissociation constant the Examiner takes official notice." Thus, the allegations made in the official notice have changed over the course of prosecution.

In any event, the Applicants note that the current rejection is non-final and respectfully traverse the taking of official notice for the following reasons. First, the technical line of reasoning underlying the decision to take official notice is not "clear and unmistakable," as required by MPEP 2144.03B. The MPEP also states that "official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known (2144.03A)" and further that "it would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. For example, assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art." *In re Ahlert*, 424 F.2d at 1091, 165 USPQ at 420-21. See also *In re Grose*, 592 F.2d 1161, 1167-68, 201 USPQ 57, 63 (CCPA 1979) ("[W]hen the PTO seeks to rely upon a chemical theory, in establishing a prima facie case of obviousness, it must provide

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evidentiary support for the existence and meaning of that theory.") The official notice taken in the rejection has clearly not met the high burden established by the MPEP.

Here, the Official Action is attempting to take notice of technical facts in an area of esoteric technology without providing any evidentiary support or even technical reasoning. The dissociation constant of a substance measures the propensity of the substance to reversibly separate into smaller components. The dissociation constant of a ternary compound has no direct relationship to whether or not a binary component of the ternary compound is phase segregated. Moreover, the Official Action has not even attempted to provide the dissociation constants of either Zn_2SnO_4 or ZnSnO_3 nor explain how the dissociation constants allegedly relate to whether or not the binary components of either Zn_2SnO_4 or ZnSnO_3 are phase segregated. In fact, the allegations made in the official notice are so vague and unsupported that it is difficult for the Applicants to further traverse them. The Applicants request further explanation behind the official notice statement and also respectfully submit that the official notice directly violates the prohibitions set forth in the MPEP. That is, the Official Action is attempting to take notice of a technical fact based, allegedly, on a chemical theory without "provid[ing] evidentiary support for the existence and meaning of that theory."

Accordingly, the Applicants respectfully submit that the attempt to take official notice is clearly unsubstantiated and improper. Moreover, Carcia, like the remaining prior art of record fails to teach or suggest the features of claims 8, 9, 33, and 34. As such, withdrawal of this rejection and allowance of the claims is respectfully requested.

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Claim Rejections Under 35 U.S.C. §103

The test for determining if a claim is rendered obvious by one or more references for purposes of a rejection under 35 U.S.C. § 103 is set forth in *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, 82 USPQ2d 1385 (2007):

“Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” Quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966).

According to the Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in view of *KSR International Co. v. Teleflex Inc.*, Federal Register, Vol. 72, No. 195, 57526, 57529 (October 10, 2007), once the *Graham* factual inquiries are resolved, there must be a determination of whether the claimed invention would have been obvious to one of ordinary skill in the art based on any one of the following proper rationales:

(A) Combining prior art elements according to known methods to yield predictable results; (B) Simple substitution of one known element for another to obtain predictable results; (C) Use of known technique to improve similar devices (methods, or products) in the same way; (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (E) “Obvious to try”—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; (G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to

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arrive at the claimed invention. *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, 82 USPQ2d 1385 (2007).

Furthermore, as set forth in *KSR International Co. v. Teleflex Inc.*, quoting from *In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006), “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”

Furthermore, as set forth in MPEP 2143.03, to ascertain the differences between the prior art and the claims at issue, “[a]ll claim limitations must be considered” because “all words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385.

If the above-identified criteria and rationales are not met, then the cited references fail to render obvious the claimed invention and, thus, the claimed invention is distinguishable over the cited references.

Claims 19, 21, 22 and 24

Claims 19, 21, 22 and 24 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia and in view of Taylor. This rejection is respectfully traversed for at least the following reasons.

Independent claim 19 recites, *inter alia*, “a semiconductor formed from a zinc-tin oxide compound having the following stoichiometry: Zn_2SnO_4 .” This feature is neither taught nor suggested by Carcia, as set forth above. Taylor fails to cure the deficiencies of Carcia. Therefore, claim 19 is allowable over Carcia and Taylor, at least, for the reasons set forth above. Accordingly, withdrawal of this rejection and allowance of independent claim 19 and the claims that depend therefrom are respectfully requested.

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Claim 12

Claim 12 was rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Hong et al. (6,674,495) ("Hong").

The features of independent claim 50, from which claim 12 depends, are not taught or suggested by Carcia, as set forth above. Hong fails to cure the deficiencies of Carcia. Therefore, claim 12 is allowable over Carcia and Hong at least by virtue of its dependence upon allowable claim 50, for the reasons set forth above. Accordingly, withdrawal of this rejection and allowance of claim 12 are respectfully requested.

Claims 14 and 38

Claims 14 and 38 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Krivokapic et al. (6,100,558) ("Krivokapic").

The features of independent claim 50, from which claim 14 depends, are not taught or suggested by Carcia, as set forth above. Krivokapic fails to cure the deficiencies of Carcia. Therefore, claim 14 is allowable over Carcia and Krivokapic at least by virtue of its dependence upon allowable claim 50 for the reasons set forth above.

Claim 38 depends from independent claim 60. However, independent claim 60 is not rejected over Carcia. Therefore, claim 38 is allowable, at least, by virtue of its dependence upon claim 60, which is not rejected over Carcia.

However, independent claim 60 is rejected over Carcia in view of Cillessen. Cillessen fails to cure the deficiencies of Carcia, as described in greater detail below. Therefore, claim 38 is allowable over both Carcia and Cillessen, taken alone or in

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combination, by virtue of its dependence upon allowable claim 60. Accordingly, withdrawal of this rejection and allowance of the claims is respectfully requested.

Claims 15 and 39

Claims 15 and 39 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia and Krivokapic and over Carcia, Cillessen, and Krivokapic and further in view of Hornik.

The features of independent claim 50, from which claim 15 depends, are neither taught nor suggested by Carcia, Cillessen, Krivokapic, or Hornik, taken alone or in combination, as set forth above with respect to Carcia and as set forth below, with respect to Cillessen. Therefore, claim 15 is allowable over the cited art of record, at least, by virtue of its dependence upon allowable claim 50 for the reasons set forth herein.

Claim 39 depends from independent claim 60, which is rejected over Carcia in view of Cillessen. However, Cillessen fails to cure the deficiencies of Carcia, as described in greater detail below. Therefore, claim 39 is allowable over both Carcia and Cillessen, taken alone or in combination, at least by virtue of its dependence upon allowable claim 60. Accordingly, withdrawal of this rejection and allowance of the claims is respectfully requested.

Claim 60

Independent claim 60 was rejected under 35 U.S.C. 103(a) as being unpatentable over Carcia in view of Cillessen. This rejection is respectfully traversed because Carcia and

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Cillessen, taken alone or in combination, fail to teach or suggest the features of independent claim 60.

A Zinc-Tin Oxide combination, as well as Zn_2SnO_4 , are NOT Taught or Suggested by the Cited Art

Independent claim 60 recites, *inter alia*, "a channel...comprised of a ternary compound containing zinc, tin and oxygen...having the following stoichiometry: Zn_2SnO_4 ." As set forth above, with respect to the rejection of independent claims 4 and 48, the Official Action acknowledges that Carcia fails to disclose the claimed ternary compound recited above. Instead, Carcia discloses a list of binary compounds, which includes zinc oxide (ZnO) and tin oxide (SnO_2). The rejection appears to utilize the disclosure by Carcia to use "combinations" of the disclosed binary compounds to render the allegation that Carcia suggests the claimed stoichiometry. However, as set forth above, the combination of the disclosed list of compounds would not result in the ternary compound having the stoichiometry: Zn_2SnO_4 , because this ternary compound requires the addition of two zinc oxide molecules with a single tin oxide molecule. Moreover, no motivation has been provided, which would suggest that a person having ordinary skill in the art would have been motivated to pick and choose from amongst the list of disclosed compounds to create the claimed ternary compound or to combine the disclosed binary compounds in the necessary proportions to create Zn_2SnO_4 .

The disclosure of Cillessen is similar to the disclosure of Carcia. However, Cillessen discloses an even longer list of binary compounds to choose from. In fact, Cillessen provides a list of eight different binary compounds and states that "mixtures of these oxides or compounds" may be used. While zinc oxide and tin oxide are included amongst the list of

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eight different compounds, the number of possible combinations that could be created from the disclosed list of eight is far greater than the 15 disclosed by Carcia.

Cillessen does disclose the use of three ternary compounds, but fails to teach or suggest any zinc-tin oxide combination and also fails to teach or suggest combining the compounds in anything but the simplest one-to-one proportions. That is, like Carcia, Cillessen fails to teach or suggest adding multiple molecules of any one compound with a single molecule of another compound. Thus, the Applicants cannot determine why Cillessen is cited in the rejection and the Official Action fails to state the specific reasons for citing Cillessen.

In any event, Carcia and Cillessen, taken alone or in combination, fail to teach or suggest, at least, a zinc-tin oxide combination and the stoichiometry: Zn_2SnO_4 . The Official Action states that "the claim would have been obvious because one of ordinary skill has good reason to pursue the known options within his or her technical grasp; if this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." First, the Applicants note that not only is the claimed stoichiometry not taught or suggested, but Carcia and Cillessen also fail to teach or suggest any combination containing zinc-tin oxide, as set forth above. Therefore, a critical technological nexus between the actual disclosures of Carcia and Cillessen and the claimed features is missing in the art cited in the Official Action. The rejection attempts to compensate for the deficiencies in the cited art with a naked allegation that arriving at the claimed features would have been obvious without providing the necessary evidentiary support. The Applicants respectfully submit that this leap in reasoning is clearly improper because it is unsupported by the disclosures of Carcia and Cillessen.

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Improper and Inaccurate Motivation for Proposed Combination

Second, the motivation proffered in the Official Action does not attempt to provide any reasons why a person having ordinary skill in the art would attempt to make a zinc-tin oxide combination or attempt to combine zinc, tin, and oxygen in the asymmetric proportions necessary to create the claimed stoichiometry. Instead, the rejection merely states that "one of ordinary skill has good reason to pursue the known options within his or her technical grasp." This allegation is generic and conclusory, because it is not specific to the claimed features whatsoever, but is merely a blanket statement, which could cover virtually all possible chemical compounds having any possible stoichiometry. By the logic proffered in the rejection, the creation and use of almost any compound in almost any application would have been obvious. The Applicants respectfully submit that this is improper and that the rejection must attempt to offer some reason why the particular claimed compound and the particular claimed stoichiometry would have been obvious based on the limited disclosures of Cartia and Cillessen.

In addition, the Applicants also respectfully disagree with the proffered motivation because it is inaccurate and untrue. Pursuing every possible option available to a person having ordinary skill in the art would involve near-endless creating, implementing, testing, analyzing, re-testing, etc. Repeating this process for every possible chemical compound would be, if not impossible, prohibitively labor-intensive, time-consuming, wasteful, and expensive. Therefore, the experimental creation and testing of different compounds may, at first glance, seem scientifically desirable; however, "pursuing" every possible compound is forbidden by real-world practicability limitations.

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Moreover, the Official Action provides no evidence that the claimed zinc-tin oxide ternary compound and the claimed stoichiometry is a "known" option. In fact, the evidence contradicts this assertion, because both Carcia and Cillessen, like the remaining prior art of record fail to teach or suggest not only a zinc-tin oxide ternary compound, but also combining compounds in different molecular proportions. Thus, the attempt to proffer a motivation in the Official Action is clearly improper and inaccurate.

Unexpected Experimental Results

The Applicants note that a showing of unexpected results is unnecessary in the current situation because the cited art of record fails to teach or suggest the claimed features and the Official Action fails to proffer a proper motivation to create, not only the claimed zinc-tin oxide combination, but also the claimed stoichiometry. However, the Applicants note that the originally filed specification clearly teaches that the discovered zinc-tin oxide combination provides unexpected results. On page 3, lines 27-31, of the originally filed specification, the Applicants state that experimental results revealing a high degree of charge mobility in the present ternary channel materials were unexpected."

The MPEP states that "A greater than expected result is an evidentiary factor pertinent to the legal conclusion of obviousness ... of the claims at issue." *In re Corkill*, 711 F.2d 1496, 226 USPQ 1005 (Fed. Cir. 1985) (MPEP 716.02(a)). Here, the Applicants have clearly taught that the claimed features provide the unexpected result of a "greater than expected" charge mobility. Although this showing is not required for a finding of non-obviousness, it does provide additional evidence warranting allowance of the claims.

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Accordingly, withdrawal of this rejection and allowance of claim 60 is respectfully requested because Carcia and Cillessen, taken alone or in combination, fail to render the features of claim 60 obvious.

Claims 64

Claim 64 was rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Carcia in view of Cillessen and Ando et al (6,184,946) ("Ando"). This rejection is respectfully traversed because Carcia and Cillessen, taken alone or in combination, fail to teach or suggest the features of independent claim 64.

Claim 64 recites, *inter alia*, "a ternary compound containing zinc, tin and oxygen having the stoichiometry: Zn_2SnO_4 ." As set forth above, Carcia and Cillessen, fail to teach or suggest at least these features. Ando fails to cure the deficiencies of Carcia and Cillessen. Therefore, claim 64 is allowable for the reasons set forth above.

Accordingly, withdrawal of this rejection and allowance of claim 64 is respectfully requested.

Claims 4, 7-9, 12, 19, 26, 32-35, 37, 48, 50, 54, 55, 60, and 64

Claims 4, 7-9, 12, 19, 22-24, 26, 29, 32-35, 37, 48, 50-53, 54-59, 60-63 and 64-67 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Cillessen.

As set forth above, independent claims 4, 19, 48, 60, and 64 recite "a zinc-tin oxide compound having the following stoichiometry: Zn_2SnO_4 " and independent claim 50 recites "a ternary compound containing zinc, tin, and oxygen having the stoichiometry:

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$(ZnO)_i(SnO_2)_{1-j}$, where j is between 0.05 and 0.95. Also, as explained above, Cillessen fails to teach or suggest, at least, these features.

Therefore, independent claims 4, 19, 48, 50, 60, and 64 are allowable over Cillessen for the reasons set forth above. Accordingly, withdrawal of the rejection and allowance of the claims is respectfully requested.

In addition, claims 8, 9, 33, and 34 are rejected over Cillessen for the same erroneous reasons by which they are rejected over Carcia. Therefore, Cillessen fails to teach or suggest the features of claims 8, 9, 33, and 34 for the reasons set forth above. Accordingly, withdrawal of the rejection and allowance of claims 8, 9, 33, and 34 is respectfully requested.

Claims 6, 11, 31 and 36

Claims 6, 11, 31 and 36 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Cillessen in view of Carcia.

As set forth above, Cillessen in view of Carcia fail to teach or suggest the features of independent claims 50 and 60 from which claims 6, 11, 31, and 36 depend, respectively. Therefore, claims 6, 11, 31, and 36 are allowable over Cillessen and Carcia at least by virtue of their respective dependencies on allowable claims 50 and 60.

In addition, Cillessen and Carcia fail to teach or suggest the features of claims 6 and 31, as set forth above. Therefore, claims 6 and 31 are also allowable over Cillessen and Carcia for the reasons set forth above.

Accordingly, withdrawal of this rejection and allowance of the claims is respectfully requested.

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Conclusion

In light of the foregoing, withdrawal of the rejections of record and allowance of this application are earnestly solicited.

Should the Examiner believe that a telephone conference with the undersigned would assist in resolving any issues pertaining to the allowability of the above-identified application, please contact the undersigned at the telephone number listed below.

Please grant any required extensions of time and charge any fees due in connection with this request to deposit account no. 08-2025.

Respectfully submitted,

Dated: February 26, 2008

By


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